



City of Saco

Public Works Department
Saco City Hall
300 Main Street
Saco, Maine 04072-1538

Patrick Fox	Public Works Director
Telephone:	(207) 284-6641
Fax:	(207) 282-8212
Email:	pfox@sacomaine.org

April 5, 2016

Division of Purchases
Burton M. Cross Building, 4th Floor
111 Sewall Street
9 State House Station
Augusta, Maine 04333-0009

Subject: RFP# 201601017
2016 Grants for Stream Crossing Public Infrastructure Improvements

Dear Grant Review Team:

The City of Saco is pleased to submit a 2016 Grant Application for Stream Crossing Public Infrastructure Improvements. Our application has been prepared in accordance with the RFP# 201601017 requirements as issued by the MDEP on February 12, 2016.

The City is proposing to replace the existing Industrial Park Road culvert at the Goosefare Brook crossing. The existing culvert crossing has been selected for your consideration through the Grant Process due to the following reasons:

- **Condition** – The existing triple barrel (71" x 47") corrugated metal arch pipe crossing was installed in the early 1980's. The protective coating system for the culverts has failed and deterioration of the culvert pipe material has accelerated. It is estimated that the existing culvert will need to be replaced within the next 5 to 10 year time period.
- **Flooding and Debris Management** – During significant rainfall events, high water occurs on the inlet side of the culvert due to debris accumulation. This is largely due to the multiple barrel configuration of the culvert installation.
- **Timing** – Industrial Park Road is scheduled for paving by MaineDOT in the summer of 2017 or 2018; however, replacement of this culvert will not be funded by MaineDOT.
- **Goosefare Brook Watershed Management Plan** – The City has been working with the MeDEP in the development of a Watershed Management Plan (WMP) for Goosefare Brook to improve water quality and fisheries habitat for the stream. The draft WMP has been released and is expected to be approved by MeDEP in May of 2016. One of the recommendations of the WMP is to replace this culvert to address the fish barrier identified by MeIF&W.

The City is very excited and pleased to submit this grant application for your consideration. We believe this project will result in a much needed improvement to an important stream crossing from a transportation and fisheries perspective.

We look forward to hearing from you. If you have any questions or need any additional information, please feel free to contact me directly.

Thank you for considering this grant request.

Sincerely,

CITY OF SACO

A handwritten signature in black ink, appearing to read "Patrick Fox", with a stylized flourish at the end.

Patrick Fox
Public Works Director

APPENDIX 1

NOTE: Please refer to the full RFP instructions before completing this application. Specific details and explanations are included on pages 7 thru 9 of the application.

Maine Department of Environmental Protection Request for Proposals for Stream Crossing Public Infrastructure Improvement Projects Proposal Application Form - 2016 RFP# 201601017			
I. Applicant Information			
Applicant Name City of Saco			
Applicant Mailing Address 300 Main Street	City Saco	State Maine	Zip 04072
Applicant Phone # 207.284.6641	Applicant Email Address pfox@sacomaine.org		
II. Agent/Consultant Information, if applicable			
Agent Name Joseph Laverriere, P.E. – Saco City Engineer			
Agent Mailing Address 300 Main Street	City Saco	State Maine	Zip 04072
Agent Phone # 207.284.6641	Agent Email Address jlaverriere@sacomaine.org		
III. Culvert/Stream Crossing Location (please attach a map(s) of the project location and a photo of the existing culvert/crossing to this application as described in Section IV):			
Municipality or Unorganized territory where project will take place: Saco	GPS Location in Digital Format: 43.522269 -70.446406 (Available on google maps by clicking the location on the map)		
Culvert/crossing location. Name of the road on which the culvert/crossing is located and distances to the nearest road intersections. Industrial Park Road @ Goosefare Brook Approximately 3,000 feet northwesterly from the intersection of North Street (Route 112) and Industrial Park Road.			
Watershed Location: List the name of the stream, brook, or the water body the culvert is located on, and the downstream, brooks streams, rivers, lakes, ponds, bays, etc. The culvert is located on the main stem of Goosefare Brook. Below this point, Goosefare Brook flows approximately 3.5 miles with discharge into the Atlantic Ocean.			
Required Maps and Photos: Include the following photos and maps (in color if possible). <input checked="" type="checkbox"/> Map marking culvert/crossing location and showing road names. <input checked="" type="checkbox"/> Map showing satellite view with culvert/crossing location marked. <input checked="" type="checkbox"/> Optional - Map showing culvert/crossing location on Maine Stream Habitat Viewer. Note – All photos should be <u>dated</u> . <input checked="" type="checkbox"/> Photo(s) showing condition of culvert/crossing. <input checked="" type="checkbox"/> Photo(s) showing downstream side of culvert/crossing (including water level at end of culvert). <input checked="" type="checkbox"/> Photo(s) showing inlet side of culvert/crossing (including water level at end of culvert/crossing). <input checked="" type="checkbox"/> Photo(s) showing safety conditions such as sinkholes, collapsing structures, erosion undermining, etc. <input type="checkbox"/> Photo(s) showing downstream erosion impacts, if any.			

IV. Scoring Criteria for Public Infrastructure Information: (25 Points total):

Has the culvert/crossing washed out, flooded, overtopped the road, or failed in the past 20 years due to storm events? If yes, please describe how often, and the approximate dates of culvert/crossing failure. (Include pictures if available.)

Industrial Park Road has overtopped slightly during two previous major storm events over the past 20 years. The cause for the overtopping was due to debris blockage on the inlet end of the culvert. No significant damage was caused during these events and road remained passable at all times.

What is the current condition of the culvert/crossing?

Existing culvert crossing consists of triple barrel, corrugated metal arch culverts (71" by 47" size each) that were installed in the early 1980's. The culverts are in fair condition. Much of the factory applied protective coatings are gone and the culvert material is deteriorating. Several joints are known to be open resulting minor sink holes in the roadway and embankment.

Discuss current safety concerns of the existing culvert/crossing?

Industrial Park Road is a major commuter road that provides turnpike access to a regional area served by the Route 112 corridor. In addition, Industrial Park Road provides primary access to the Saco Industrial Park. If the culvert were to fail, then significant impact would be created to the regional transportation system.

In how many years from now do you estimate the culvert/crossing would likely have a complete failure, a complete collapse, or total washout?

☐ 1 year ☐ 3 years ☐ 5 years ☒ 10 years ☐ 15 years ☐ 20 years ☐ 25 years

Has the culvert/crossing been inspected by the Maine Department of Transportation? If so, what is the date of the last inspection and condition classification by Maine DOT?

Unknown.

Discuss what sort of impacts would occur if the culvert/crossing were to fail? For instance, are there critical public services (fire or police station, hospital, school, public works facility) located on this road that would be cutoff or required to detour?

Industrial Park Road provides turnpike access to a large regional area. Daily traffic along the Route 112 corridor at Industrial Park Road is in excess of 20,000 vehicles. Industrial Park Road is accessible on either end; therefore, no users would be isolated or cut-off; however, the detour length for most users in the event of a culvert failure would be nearly 4 miles.

If the culvert/crossing fails would homes, businesses, or infrastructure be cut off or required to detour?

#Cut off: >5,000 year round homes

#Cut off: N/A seasonal homes

#Cut off: >100 businesses (small to medium size, primarily associated with industrial park)

#Cut off: 1 infrastructure (water company)

#Cut off: 1 other (emergency services, including ambulance route to hospital)

How many miles, and how many of each would be required to detour?

>5,000 year round homes required to detour 4 miles

N/A seasonal homes required to detour _____ miles

>100 businesses (multiple small to med. users) required to detour 4 miles

1 infrastructure (list type) required to detour 4 miles

1 other (emergency services) required to detour 4 miles

Private roads only: If the culvert or crossing is located on a private road and directly impacts a lake or pond, is public access to the lake or pond prohibited or highly restricted to foot access or carry in only?

N/A

What is the annual maintenance fee per landowner per year for the private road?

N/A

V. Scoring Criteria for Proposed Culvert/Crossing Cost & Budget Information (25 Points total):

Existing culvert/crossing material: Circle One (Plastic pipe, concrete pipe, corrugated metal pipe, concrete box culvert, stone/granite culvert, pipe arch, bridge, or Other type (describe):

Triple barrel CMP arch pipes – Each barrel has dimensions described below

Length: 90'	Diameter:	Width: 71"	Height: 47"	Approximate Age: 35 years +/-
-----------------------	-----------	----------------------	-----------------------	---

Proposed culvert/crossing material: Circle One (Plastic pipe, concrete pipe, corrugated metal pipe, concrete box culvert, stone/granite culvert, pipe arch, bridge, or Other type (describe): **Three sided concrete bridge**

Length: 90'	Diameter:	Width: 16' clear	Height: 4' clear	Amount Requested: \$95,000
-----------------------	-----------	----------------------------	----------------------------	--------------------------------------

Population of town, group or association funding project: 18,877 (source 2013 census)	Total cost of project (including in kind costs): \$225,000
--	--

Discuss approximate funds spent on physical repairs within the last 10 years on the culvert/crossing (exclude normal maintenance costs such as painting).

\$0.00

What are the estimated construction costs for the culvert/crossing replacement? Include estimated items for mobilization of equipment, erosion control and stream diversion, existing culvert removal, installation of the new culvert, permanent stabilization, and engineering design costs.

\$10,000 Mobilization
\$3,000 Erosion Control and Stream Diversion
\$7,000 Remove Existing Culverts
\$180,000 Installation of New Culverts
\$20,000 Permanent Stabilization
\$5,000 Engineering Design Costs (In Kind Services)

Do you have engineered design plans and construction specifications for the replacement culvert/crossing? If yes, describe who designed the plans, and when the plans were completed.

No.

What is the estimated construction schedule for the proposed project? Include estimated start and completion dates, and include any time of year restrictions from state or federal permitting agencies. Do you have permits? Yes, No, or Application Submitted

Week of September 5, 2016 – Mobilize Equipment and Receive Materials
September 9, 2016 – Complete Temporary Stream Diversion Work
September 10, 2016 – Shutdown Road and Begin Culvert Removal and Replacement Work
September 11, 2016 – Complete Culvert Replacement Work and Backfill of Roadway
September 12, 2016 – Re-Open Road to Commuter Traffic
September 23, 2016 – Complete Permanent Stabilization of Disturbed Areas and Roadway

VI. Environmental Scoring Criteria for Proposed Culvert/Crossing Information (50 Points total):
(See Section V.B. on pages 10-11 for more detail.)

Climate Resiliency (10 Points) Explain how the new culvert/crossing has been sized appropriately for the watershed. Discuss any watershed studies or hydrology studies that have been conducted, if any.

Culvert crossing designed to convey the 500-year storm event before overtopping the roadway. Preliminary hydrologic analysis performed using StreamStats Version 3.0:ME software available through the U.S. Geological Survey. Sizing of the box culvert provides increased conveyance capacity above existing culverts. The culverts are also being designed as a three sided bridge with open bottom for improved fish passage.

Please describe what provisions for addressing climate resiliency were used/will be used in designing the replacement culvert/crossing. Will the design meet the 100 year flood criteria data, if not explain the rationale for not meeting this criteria. Discuss any watershed studies or hydrology studies that have been conducted, if any.

No formal hydrologic study has been performed at this point. Use of StreamStats software for preliminary sizing to achieve 500-year design flow conveyance. The culvert is located within a Zone A 100-Year Flood Plain as determined by FEMA.

Habitat (25 Points) If the existing culvert/crossing was to be replaced, how much habitat (i.e., miles of stream, or acres of wetland habitat) would be opened up to fish passage and other aquatic life?

The watershed area above the culvert crossing consists of 1.8 square miles in area, consisting of approximately 21.3% national wetland areas. The length of the stream channel above the culvert crossing is approximately 5,000 feet in length.

List the type of fish, aquatic life, or wildlife affected by the project.

☒ Brook Trout ☐ Brown Trout ☐ Rainbow Trout ☐ Landlocked Atlantic Salmon
☐ Atlantic Salmon (present today) ☐ Atlantic Salmon (potential modeled habitat)
☐ Rainbow Smelt ☐ Alewives ☒ Other: Lake Chub
☒ American Eel ☐ Sea-run Brook Trout ☐ Sea-run Brown Trout

Has the presence of these fish been confirmed by Maine IF&W, Maine DMR, or US FWS? ☒ Yes ☐ No
Please list agency confirming and the species they have identified:

Maine IF&W. See Attached Sheet (Excerpt of the Draft Goosefare Brook Watershed Management Plan).

Is the existing habitat active spawning habitat today? If so, discuss.

Yes. See Attached Sheet (Excerpt of the Draft Goosefare Brook Watershed Management Plan).

Is the culvert identified by the Maine Stream Habitat Viewer or by an Agency as a Barrier? ☒ Yes ☐ No

Barrier Identification
#55276

Type of Barrier
Barrier

Estimate how many months per year is Barrier a Full Barrier preventing any fish passage? **12 months**

Is the Culvert undersized?
☐ Yes ☒ No

Width of Culvert:
18' (total existing width of triple barrel crossing)

Width of natural stream (not pool at culvert):
8' to 9'

Is the new crossing/culvert 1.2 times the stream bed (bank full) width? If not, please explain the rationale for a smaller size.

Yes. Replacement culvert will have a clear opening width of 16', which exceeds the 1.2 times bank

full width. The culvert will also have a natural bottom.	
How many miles would open <u>upstream</u> to the next Barrier? Approximately ½ mile.	How many miles <u>downstream</u> to the next Barrier? Less than ¼ mile.
<p>Connectivity: Describe significant adjacent fisheries or habitats such as heritage ponds impacted by this project. Include distances from the project to these other areas.</p> <p>There are no heritage ponds along Goosefare Brook; however, this water course does provide excellent habitat for wild brook trout as evidenced by the fisheries data and recent fisheries survey performed by Maine IF&W.</p>	
<p>Please provide other information about the proposed project that you believe is important:</p> <p>Industrial Park Road is scheduled to be paved by Maine DOT in 2018. After the roadway is paved, a 5-year moratorium will be placed on the roadway that will prohibit excavation within the street, unless it is an emergency. If the culvert is not replaced before 2018, then it would not be able to be replaced under routine maintenance until 2024.</p> <p>This culvert replacement project is also identified for replacement as part of the Goosefare Brook Watershed Management Plan (WMP) to improve fisheries habitat along the stream. The Goosefare Brook WMP is currently in draft format and expected to be approved by the MeDEP in May 2016.</p>	

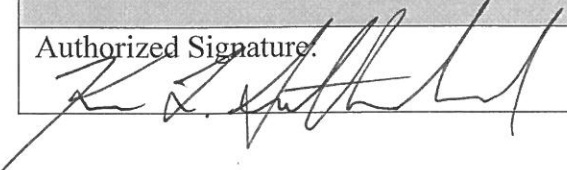
APPENDIX 2

State of Maine
Department of Environmental Protection
Bureau of Land and Water Quality
DEBARMENT, PERFORMANCE and NON-COLLUSION CERTIFICATION
RFP# 201601017
2016 Grants for Stream Crossing Public Infrastructure Improvements

By signing this document I certify to the best of my knowledge and belief that the aforementioned organization, its principals, and any subcontractors named in this proposal:

- a. Are not presently debarred, suspended, proposed for debarment, and declared ineligible or voluntarily excluded from bidding or working on contracts issued by any governmental agency.*
- b. Have not within three years of submitting the proposal for this contract been convicted of or had a civil judgment rendered against them for:*
 - i. fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a federal, state or local government transaction or contract.*
 - ii. violating Federal or State antitrust statutes or committing embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;*
 - iii. are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or Local) with commission of any of the offenses enumerated in paragraph (b) of this certification; and*
 - iv. have not within a three (3) year period preceding this proposal had one or more federal, state or local government transactions terminated for cause or default.*
- c. Have not entered into a prior understanding, agreement, or connection with any corporation, firm, or person submitting a response for the same materials, supplies, equipment, or services and this proposal is in all respects fair and without collusion or fraud. The above mentioned entities understand and agree that collusive bidding is a violation of state and federal law and can result in fines, prison sentences, and civil damage awards.*

Failure to provide this certification may result in the disqualification of the Bidder's proposal, at the discretion of the Department.

Name: Kevin Sutherland	Title: City Administrator
Authorized Signature: 	Date: April 5, 2016



Legend
City_Street_Centerlines



City of Saco

Culvert Replacement

1 inch = 300 feet
175 87.5 0 175 Feet

February 1, 2015
William Mann

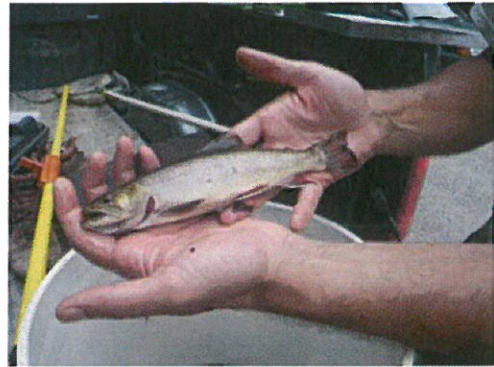
City of Saco
300 Main St
Saco, ME 04072

Produced by Joe Cooper

identify malfunctioning septic systems as well as investigations of sewer and stormwater infrastructure. This has led to removal of numerous grey and black water discharges throughout the watershed as well as upgrades and expansion of sewer and stormwater infrastructure. Despite these efforts, bacteria levels continue to be elevated in both fresh and brackish areas.

1.9.9 FISHERIES

Before the turn of the last century, Goosefare Brook and Deep Brook were considered favorite fishing areas in the Saco area. In the 1870s, local sportsmen held an annual fish and game hunt that focused on harvesting salmon the trout for an annual gala (Goosefare Brook Watershed Survey Report 2002). Although the stream was later considered 'fished out', Goosefare Brook and its tributaries are considered brook trout habitat. Recent surveys and local anecdotal evidence indicates that the stream once again has a healthy fishery in places. The Maine IF&W conducted a survey on 7/18/58 at an unknown survey site in Old Orchard Beach and noted heavy fishing pressure. The survey identified two legal brook trout and abundant black-nosed dace, brown bullhead, golden shiners, eels, white suckers and three spine stickleback.



Maine IF&W biologist displays a brook trout collected on Goosefare Brook adjacent to the Park and Ride on Industrial Park Road on 7/23/15. PHOTO CREDIT: Maine DEP

Maine IF&W conducted surveys in 1983 and 1986 as well and documented numerous American eel and lake chub at three locations, but very limited brook trout presence (Appendix II, Table 7). As part of the watershed survey planning process, Maine IF&W conducted an electrofishing survey at five sites on July 23, 2015. They found brook trout at all five sites. Despite observed adjacent development impacts at the Park and Ride site, they noted especially good habitat and healthy populations at two upstream sites.

In addition to brook trout, another species of interest for Goosefare Brook is smelt. In 2004, the National Oceanic and Atmospheric Administration listed the rainbow smelt as a federal Species of Concern. The rainbow smelt is a small fish that lives in estuaries and offshore waters, and spawns in shallow freshwater streams each spring. Its numbers have dropped dramatically during the last fifteen to twenty years for reasons that are not well understood. Although smelt has not been identified in Goosefare Brook surveys, the tidal portion of the stream is identified as potential smelt habitat (see Maine Stream Habitat Viewer).

1.10 GEOMORPHIC AND IN-STREAM HABITAT ASSESSMENTS

1.10.1 STREAM CORRIDOR ASSESSMENT

In July and August 2015, project staff conducted an SCA survey for Goosefare Brook and its tributaries. The SCA survey method (Maryland DNR 2001) rapidly assesses the general physical condition of the stream and identifies the location of a variety of environmental problems and restoration opportunities within the stream corridor. The primary types of problems sites

1.10.3 USFWS FISH BARRIER ASSESSMENT

The United States Fish and Wildlife Service (USFWS) conducted a fish barrier survey of the Goosefare Brook watershed in 2015 using the Maine Stream Road Crossing Survey Manual (2008). Surveyors assessed 40 stream crossings and measured culvert size, outlet drop, pool depth, and numerous other parameters. Staff evaluated the data and rated fish culverts as passable, barriers, or potential barriers for aquatic organisms. Preliminary data indicates that seven crossings were rated as passable, 27 were rated as potential barriers and three were rated as barriers (Table 5). Problems associated with the barriers included hanging, undersized, and multiple culverts. Survey data will be finalized in 2016 and placed on the Maine Stream Habitat Viewer at <http://mapserver.maine.gov/streamviewer/index>, which will help prioritize the potential barriers.

Table 5. Data from the 2015 USFWS Fish Barrier Assessment.

SITE ID	BASIC STRUCTURE	BARRIER CLASS	STREAM	ROAD NAME	TOWN
55061	Culvert	Barrier	Tributary	Route 5	OOB
55276	Multiple Culvert	Barrier	Goosefare Brook	Industrial Park Road	Saco
55413	Culvert	Barrier	Tributary	Ocean Park Road	Saco
55059	Culvert	No Barrier	Tributary	Free Street	OOB
55063	Bridge	No Barrier	Tributary	Clover Street	OOB
55649	Bridge	No Barrier	Goosefare Brook	Seaside Avenue	OOB
55882	Culvert	No Barrier	Tributary	Multiple	OOB
60178	Culvert	No Barrier	Tributary	Kavanaugh Road	OOB
55410	No Crossing	No Barrier	Tributary	Truman Avenue	Saco
56164	Culvert	No Barrier	Tributary	Eastern Trail	Saco
55058	Culvert	Potential Barrier	Tributary	Macintosh Lane	OOB
55060	Culvert	Potential Barrier	Tributary	Manor Street	OOB
55064	Multiple Culvert	Potential Barrier	Tributary	Temple Avenue	OOB
55183	Multiple Culvert	Potential Barrier	Goosefare Brook	Ross Road	OOB
55199	Multiple Culvert	Potential Barrier	Tributary	New Salt Road	OOB
55485	Culvert	Potential Barrier	Tributary	Old Orchard Road	OOB
55486	Multiple Culvert	Potential Barrier	Tributary	Route 5	OOB
55491	Multiple Culvert	Potential Barrier	Tributary	West Grand Avenue	OOB
55560	Bridge	Potential Barrier	Tributary	Winona Avenue	OOB
55561	Culvert	Potential Barrier	Tributary	Oceana Avenue	OOB
56167	Bridge	Potential Barrier	Goosefare Brook	Train Tracks	OOB
60177	Culvert	Potential Barrier	Tributary	Unknown	OOB
60179	Culvert	Potential Barrier	Tributary	Unknown	OOB
55261	Multiple Culvert	Potential Barrier	Goosefare Brook	Unknown	Saco
55271	Multiple Culvert	Potential Barrier	Tributary	Jenkins Road	Saco
55275	Culvert	Potential Barrier	Goosefare Brook	I-95	Saco
55390	Culvert	Potential Barrier	Goosefare Brook	Eastern Trail	Saco
55406	Culvert	Potential Barrier	Bear Brook	Unknown	Saco
55409	Culvert	Potential Barrier	Tributary	Cumberland Avenue	Saco
55411	Culvert	Potential Barrier	Tributary	Coolidge Avenue	Saco
55512	Culvert	Potential Barrier	Tributary	Atlantic Way	Saco
55544	Culvert	Potential Barrier	Tributary	Industrial Road Park	Saco
55645	Culvert	Potential Barrier	Tributary	Moody Street	Saco

Fisheries

EXCERPT OF THE DRAFT GOOSEFARE BROOK WATERSHED MANAGEMENT PLAN

Table 7. Summary of fisheries data (credit: Maine DEP)

PROJECT SITE

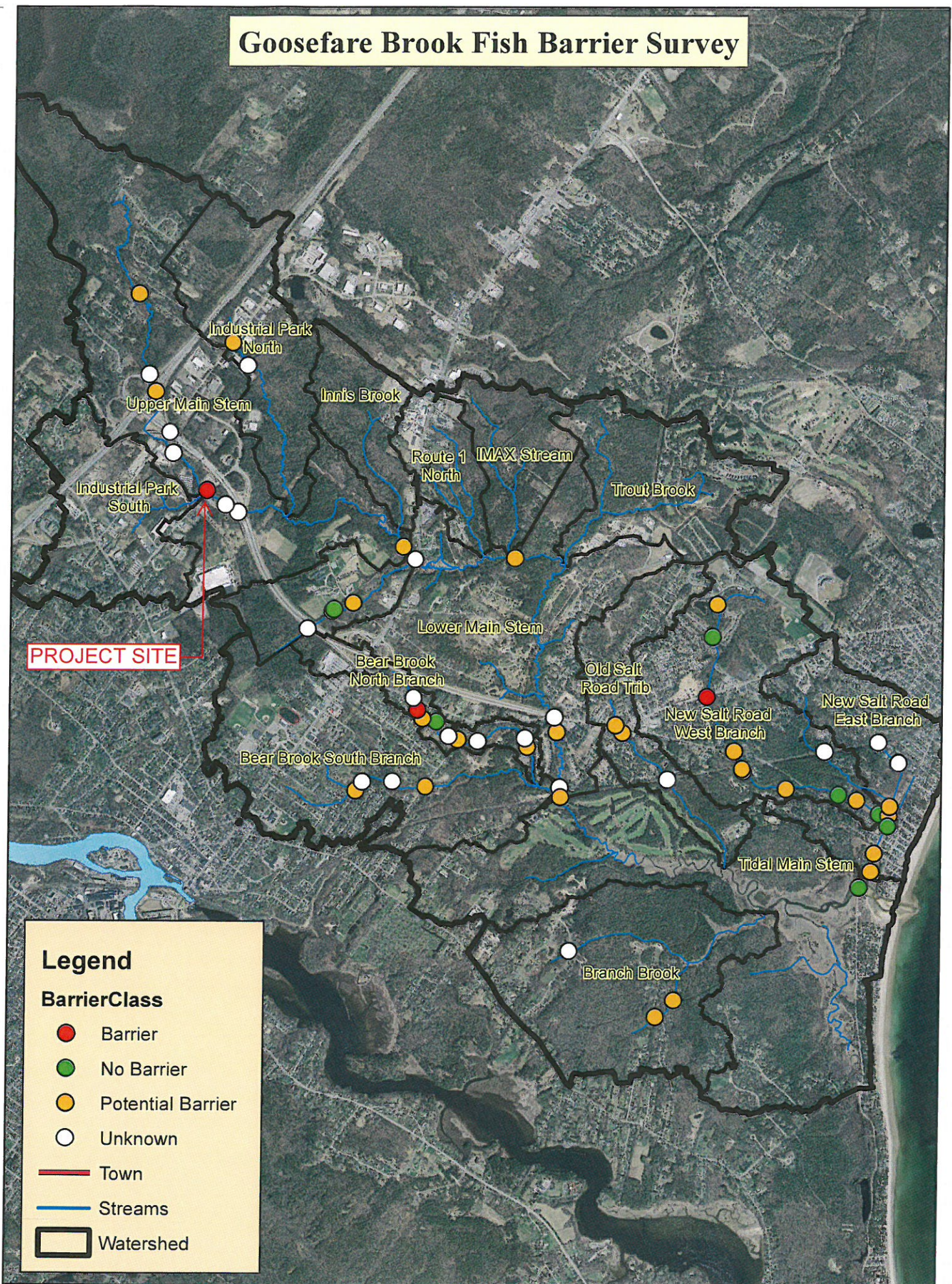
Site	Date	Fish Present	Brook Trout	Lake Chub	Eel	Three Spine Stickleback	Brook Trout Size Classes*
Jenkins Rd.	7/10/86	Yes	None	Abundant	12		
	7/23/15	Yes	19	1	1		4 YOY, 8 sublegals, 7 legals
Park & Ride	9/19/83	Yes	None	Abundant			
	7/10/86	No	None				
	7/23/15	Yes	16	10	8		5 YOY, 2 sublegals, 9 legals
Route 1	7/23/15	Yes	1		3	2	
Route 5	9/19/83	Yes	3	Abundant	Abundant		0 YOY, 0 sublegals, 3 legals
	7/23/15***	Yes	3	1	19	1	1 YOY, 0 sublegals, 2 legals
Moody St. Tributary	7/23/15	Yes	17				17 YOY, 0 sublegals, 0 legals

*YOY – young of year (2-3"), sublegals (3-5"), legals (6-11")

**Difficult to sample due to depth and high conductivity

***Also 2 White sucker and 4 Pumpkinseed sunfish

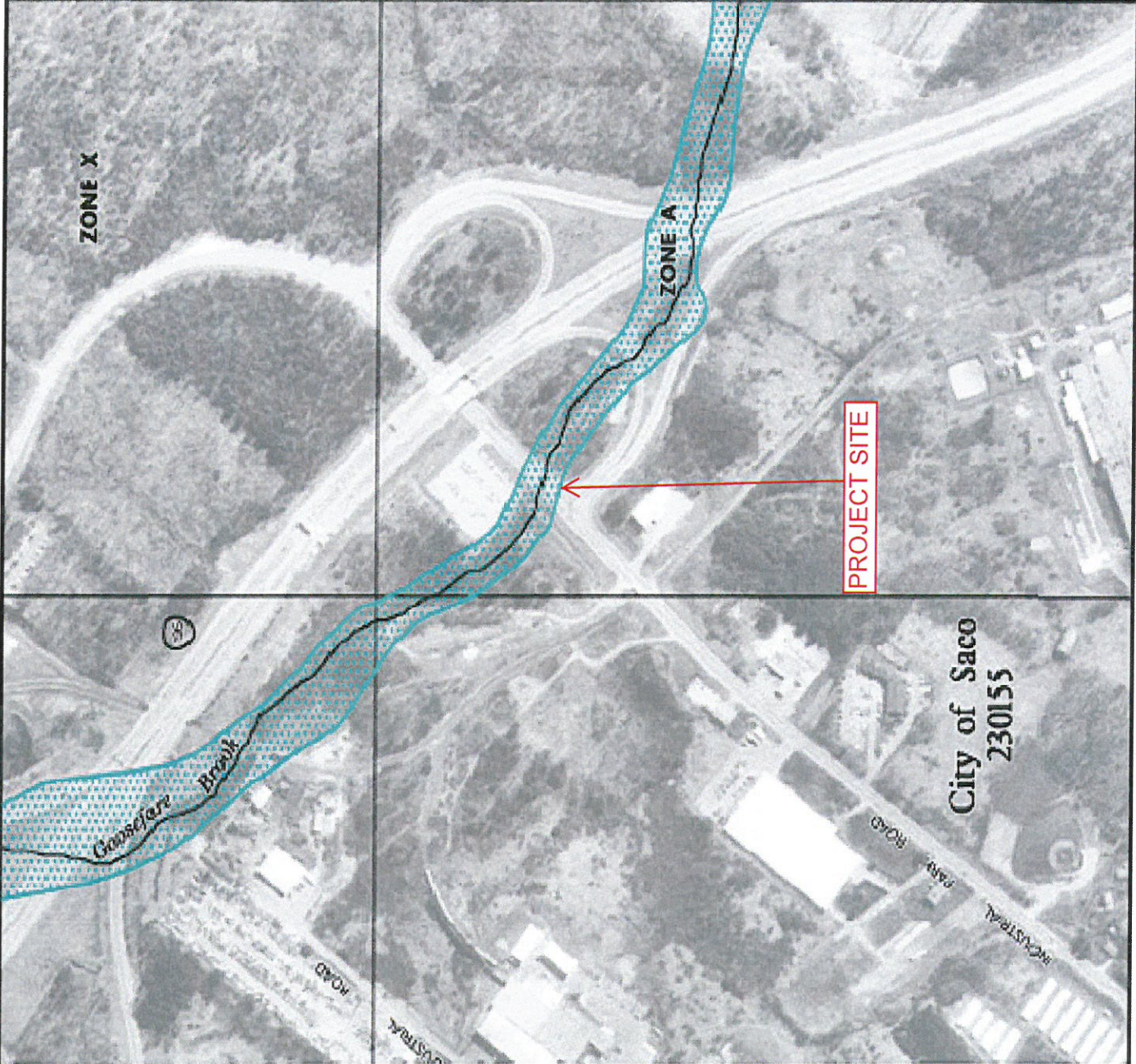
Goosefare Brook Fish Barrier Survey



NATIONAL FLOOD INSURANCE PROGRAM at 1-800-368-0020.



MAP SCALE 1" = 500'



NFIP

PANEL 00380

**FIRM
FLOOD INSURANCE RATE MAP**

CITY OF
SACO,
MAINE
YORK COUNTY

PANEL 39 OF 135

SEE MAP INDEX FOR FIRM PANEL LAYOUT

CONTAINS

COMMUNITY

SACO, CITY OF

CLASSIC PANEL 39712

DATE 10/10/00

DATE 10/10/00



MAP NUMBER
23015500380

MAP REVISED
JANUARY 5, 2006

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-AUT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps, check the FEMA Flood Map Store at www.msc.fema.gov



Photo Description: View of existing conditions at culvert inlet.

Photographer: Joseph Laverriere, P.E. – City Engineer

Photograph Taken: April 1, 2016



Photo Description: View of existing conditions at culvert outlet.

Photographer: Joseph Laverriere, P.E. – City Engineer

Photograph Taken: April 1, 2016



Photo Description: View of field measurement of stream full bank width.

Photographer: Joseph Laverriere, P.E. – City Engineer

Photograph Taken: April 1, 2016



Photo Description: View of existing conditions at culvert pipe (Note poor condition of pipe and protective coating).

Photographer: Joseph Laverriere, P.E. – City Engineer

Photograph Taken: April 4, 2016